WHAT IS CLAIMED IS:

1. A method of identifying an estimate for a clean signal random variable representing a portion of a clean signal found within a noisy signal, the method comprising:

defining a mapping random variable as a function of at least the clean signal random variable and a noise random variable;

determining a model parameter that describes at least one aspect of a distribution of values for the mapping random variable; and

using the model parameter to determine an estimate for the clean signal random variable from an observed value.

2. The method of claim 1 wherein defining the mapping random variable as a function of at least the clean signal random variable and the noise random variable comprises defining the mapping variable as a ratio of the clean signal random variable to the noise random variable.

3. The method of claim 2 wherein determining a model parameter comprises determining a mean of the mapping random variable.

4. The method of claim 1 further comprising using the model parameter to determine an estimate of the mapping random variable.

5. The method of claim 4 wherein defining the mapping random variable as a function of at least the clean signal random variable and the noise random variable comprises defining the mapping variable as a ratio of the clean signal random variable to the noise random variable.

6. The method of claim 1 wherein determining a model parameter comprises approximating a function of the mapping random variable using a Taylor series expansion.

7. The method of claim 6 further comprising performing an iteration comprising steps of:

calculating a mean for the mapping random variable using a Taylor series expansion;

setting a new expansion point for the Taylor series expansion equal to the mean of the mapping random variable; and

repeating the iteration steps using the new expansion point.

8. The method of claim 1 further comprising:

determining a clean signal model parameter that describes at least one aspect of a distribution of values for the clean signal random variable; and

using the clean signal model parameter to determine the estimate for the clean signal random variable.

9. The method of claim 8 further comprising:

determining a noise model parameter that describes at least one aspect of a distribution of values for the noise random variable; and

using the noise model parameter to determine the estimate for the clean signal random variable.

10. The method of claim 9 wherein determining the noise model parameter comprises determining the noise model parameter from noise estimates collected from the noisy signal.

11. A computer-readable medium having computer-executable instructions for performing steps comprising:

defining a random variable as a function of a signal-to-noise ratio variable;

determining distribution parameters for the signal-to-noise ratio based on the defined function; and

using the distribution parameters to determine an estimate of the signal-to-noise ratio.

12. The computer-readable medium of claim 11 wherein the random variable comprises a clean signal random variable representing a portion of a clean signal.

13. The computer-readable medium of claim 11 wherein the random variable comprises a noise signal random variable representing a noise in an observed signal.

14. The computer-readable medium of claim 11 wherein defining a random variable further comprises defining the random variable as a function of an observed value.

15. The computer-readable medium of claim 11 wherein determining a distribution parameter further comprises approximating at least a portion of the defined function with an approximation function.

16. The computer-readable medium of claim 15 wherein the approximation function comprises a Taylor series approximation.

17. The computer-readable medium of claim 16 wherein determining a distribution parameter further comprises performing an iteration.

18. The computer-readable medium of claim 17 wherein performing an iteration comprises performing steps of:

using the Taylor series approximation to determine a mean for the signal-to-noise ratio;

setting a new expansion point equal to the mean for the signal-to-noise ratio; and

repeating the step of using the Taylor series approximation to determine a mean while using the new expansion point.

19. The computer-readable medium of claim 11 further comprising using the distribution parameter to determine an estimate of the random variable.

20. The computer-readable medium of claim 19 wherein the random variable is a clean signal random variable representing a portion of a clean signal.

21. The computer-readable medium of claim 11 wherein determining a distribution parameter further comprises determining the distribution parameter based on a model parameter that describes a

distribution of clean signal values, each clean signal value representing a portion of a clean signal.

22. The computer-readable medium of claim 11 wherein determining a distribution parameter further comprises determining the distribution parameter based on a model parameter that describes a distribution of noise values.

23. The computer-readable medium of claim 22 further comprising determining the model parameter from an observed signal.